

[0060] In one embodiment, edit generation module 316 may generate commands to mute the audio of an electronic media display device (e.g., electronic media display device 402 of FIG. 4). For example, electronic media display device 402 may be a camera equipped cellular phone, and a user may be making a video call with speakerphone enabled. An intruder may walk up behind the device, and edit generation module 316 may produce commands to mute the audio output of the cellular phone. In this fashion, the audio of the video call would be muted before the intruder can actively hear the discussion.

[0061] In an alternative embodiment, edit generation module 316 may generate commands to freeze the current content displayed on an electronic media display (e.g., electronic media display 400). This may be useful as part of a parental control system. For example, electronic media display 400 may be the display of a laptop computer, and a parent may set the user preferences to freeze the screen if an intruder is detected. The parent may have not added his or her face to a list of safe users. The parent may walk up behind the display when the display is being used by a child, and edit generation module 316 may send commands to freeze the contents of the display. In this fashion, the parent may see what the child was viewing before the child can actively change the content.

[0062] Preference data 310 may be stored in a database local to or remotely from processing circuit 300, or may be received via a preference file transmitted to processing circuit 300 via input 320. Preference data 310 relates to user preferences for the visibility envelope module 314, intruder analysis module 308, and edit generation module 316. Using a preference file stored in preference data 310, the constraints of a visibility envelope may be customized for a user. Additionally, a safe user may be specified for use in determining an intruder. A user's preferred content editing methods (e.g. blurring the screen, etc.) may also be specified and stored in the preference file. For example, if a user is in a particularly sensitive environment, the user may increase the range in which a viewer is considered an intruder.

[0063] Processing circuit 300 further includes an input 320 and an output 322. Input 320 may be configured to receive image information, video information, content information, preference file information, and other information relating to the determination of a visibility envelope, performing intruder analysis, and editing content as described above. Output 322 may be configured to provide an output to a client, electronic display, or other electronic device as described above. Outputs may include commands, data including image sequences, preference file information, and other information related to editing content as described above. Outputs may involve recording the time and/or location of an intrusion event, an image of the intruder, the position of the intruder relative to the device, the determination of the viewer as either a safe viewer or as an intruder, the editing action taken, or other information related to the event.

[0064] Referring generally to FIGS. 4-14, various schematic diagrams and processes are shown and described that may be implemented using the systems and methods described herein. The schematic diagrams and processes may be implemented using the system 100 of FIG. 2 and processing circuit 300 of FIG. 3.

[0065] Referring to FIG. 4, a schematic diagram of an electronic media display device, a sensor, and a processing circuit is shown according to one embodiment. Electronic media display device 402 is shown as camera-equipped cellular

phone. Sensor 404 is shown as a camera that is coupled to electronic media display device 402. Processing circuit 300 is shown as internal processing components. Processing circuit 300 contains modules and components as describe above. While FIG. 4 only shows one camera as a sensor, it should be understood that sensor 402 may be any of the sensors discussed above. Coupling sensor 402 and processing circuit to electronic media display device 402 allows for portability of the system.

[0066] As an exemplary embodiment, electronic media display device 402 may be a tablet computing device. Sensor 404 may be an onboard camera that is coupled to the tablet computer. Processing circuit 300 may be the processing components of the tablet computer that are configured to implement the systems and methods described herein.

[0067] Referring to FIG. 5, a schematic diagram of a sensor 502 and corresponding visibility envelope 500 is shown. Analysis performed by intruder analysis module 308 of processing circuit 300 is depicted as angle 504 and distance 506. An intruder 508, maximum viewing angle 510, and maximum viewing range 512 are also depicted. According to an exemplary embodiment, angle 510 and range 512 may correspond to the specifications of an electronic media display device. For example, a particular mobile LCD display may have a maximum viewing angle of 160° and a maximum resolvable viewing distance of 15 ft. According to an alternative embodiment, angle 510 and range 512 may be offset with values as specified by a user preferences file. According to an exemplary embodiment, angle 504 is calculated as the angle between a center axis and the position of a viewer 508. The center axis may be positioned midway within the maximum viewing angle.

[0068] Referring to FIG. 6, a schematic diagram of a sensor 602 and corresponding visibility envelope 600 is shown. Analysis performed by intruder analysis module 308 of processing circuit 300 is depicted as angles 606, 608, and 610, and distances 614, 616, and 618. User 620, viewers 622, 624 and 626, maximum viewing angle 604, and maximum viewing range 612 are also depicted. According to an exemplary embodiment, angle 604 and range 612 correspond to the specifications of an electronic media display device. According to an alternative embodiment, angle 604 and range 612 may be offset with values as specified by a user preferences file. As shown in FIG. 6, viewer 626 is shown as having a range 616 that is greater than the maximum resolvable viewing range 612. For example, viewer 626 may be positioned 25 ft. from sensor 602, which is coupled to an electronic media display that has a maximum viewing range of 15 ft. In this example, viewer 626 would not be considered an intruder. Similarly, viewer 624 may be positioned at an angle that is greater than half of the display's maximum viewing angle. Viewer 624 would not be considered an intruder. However, viewer 622 is positioned at a range that is less than maximum viewing range 612, and at an angle that is less than half of the maximum viewing angle 612. Viewer 622 would be considered an intruder.

[0069] Referring to FIG. 7, a schematic diagram of a sensor 702 and corresponding visibility envelope 700 is shown. Analysis performed by intruder analysis module 308 of processing circuit 300 (as is shown in FIG. 3) is depicted as angles 706, and 710, and distances 708 and 712. Additionally, analysis related to eye detection is also depicted at 718. Viewers 716 and 720, maximum viewing angle 704 and maximum viewing range 714 are also depicted. According to an exem-